

Application No.: 09/892,027

REMARKS

Claims 1-12 are pending in this application.

Claims 1, 2, 4, and 5 were rejected under 35 USC §103(a) as being unpatentable over U.S. Patent No. 6,102,520 ("Terasawa") and further in view of U.S. Patent No. 6,166,824 ("Kadota"). Claims 3, 6-8 were rejected under 35 USC §103(a) as being unpatentable over Terasawa in view of Kadota and further in view of U.S. Patent No. 6,312,102 ("Moriyama"). Claim 9 was rejected under 35 USC §103(a) as being unpatentable over Terasawa and Kadota in view of Moriyama and further in view of U.S. Patent No. 6,466,332 to Fukasawa. Claims 10-12 were rejected under 35 USC §103(a) as being unpatentable over Terasawa and Kadota in view of Fukasawa.

1. Terasawa teaches away from fast print modes.

Terasawa teaches away from fast print modes "wherein fast print mode is accomplished by increasing droplet spacing to reduce the number of rows and columns that must be marked thereby increasing print speed and printing no more than two droplets at a single location". According to Terasawa at col. 2, lines 34-36:

The spaces [between adjacent dots on the recording material] may be a cause of the low image density, and particularly when a document is recorded with black ink, these are not desirable.

Terasawa teaches several methods for improving black density and spread on media: (1) multiple scans of the black ink recording head to deposit multiple drops of black ink (see col. 3, lines 3-6 and lines 17-20); depositing color ink in the spaces between adjacent black drops (col. 3, lines 25-29); and depositing larger volume drops of black ink (see col. 3, lines 38-42). All of these techniques are designed to eliminate or minimize the spacing between adjacent black dots.

2. Kadota teaches that fast print mode produces degraded print quality.

Kadota considers that a degraded image in fast print mode is not a problem, but that for regular printing produces a degraded image quality; see Kadota at col. 2, lines 8-21 states:

In page printers, such as laser printers, wherein the simple thinning of dot image data is always performed when low memory occurs, high speed thinning can be performed by simply deleting the data of a plurality of even-numbered (or odd-

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numbered) dot rows and the data of a plurality of even-numbered (or odd-numbered) dot columns. Although the simple thinning operation does not cause a problem in draft printing, or character or symbol printing, the simple thinning operation causes problems in images, such as photo-images, wherein density tone is important, or pop art-type line drawing images that have a regularity of dot arrangement. Thus, the density tone changes, or horizontal or vertical lines are partially lost, thereby degrading image quality.

3. One skilled in the art would not combine Kadota with Terasawa.

One skilled in the art would not combine Terasawa with Kadota and arrive at Applicants' method, since both Terasawa and Kadota teach that spaces between black dots produce a degraded image quality. If one skilled in the art were to combine Terasawa with Kadota to improve the quality of a fast print mode job using multiple passes of black printing, fast mode would slow down. If one skilled in the art were to combine Terasawa with Kadota to improve the quality of a fast print mode job using larger volume of black drops, more black ink would be used and the cost effectiveness of fast mode would be degraded. If one skilled in the art were to combine Terasawa with Kadota to improve the quality of a fast print mode job by printing color drops between the black dots, image quality would be degraded even further.

In Applicants' method, fast print mode is accomplished by increasing droplet spacing to reduce the number of rows and columns that must be marked thereby increasing print speed and printing no more than two droplets at a single location. In Applicants' method, a single droplet of black ink and a single droplet of color ink deposited at the same location forms a single black pixel at the location when the two droplets solidify.

Nothing in Terasawa or Kadota, whether taken alone or in combination teaches or suggests a method for improving black pixel print quality if a fast print mode which includes "printing a single droplet of black ink on top of the color droplet at the same location, wherein the droplet of color ink and the droplet of black ink are of substantially the same size, forming a single black pixel having increased density of substantially the same size as each of the black and color droplets at the location when the two droplets solidify."

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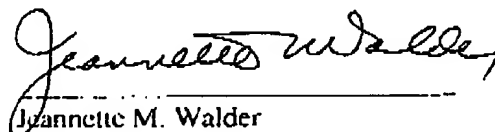
4. Nothing in Moriyama overcomes the lack of teaching of Terasawa or Kadota. Moriyama teaches forming black either by printing with black ink or forming black by printing a combination of C, M, and Y.

The Examiner cited Moriyama for teaching equally distributing color ink among black locations citing Fig. 11 and col. 19, lines 44-48. It is not clear if the reference to col. 19 is accurate in that it describes processing in units of $2n \times 2n$ pixels. Fig. 11 is part of Figs. 1-12 which, according to Moriyama, are views "showing various patterns used for recording a Blk image using C, M and Y inks according to a first embodiment." Such teaching would appear to be limited to teachings in which black is formed as a combination of C, M and Y (no black ink drop).

No additional fee is believed to be required for this amendment; however, the undersigned Xerox Corporation attorney hereby authorizes the charging of any necessary fees, other than the issue fee, to Xerox Corporation Deposit Account No. 24-0025.

Reconsideration of this application and allowance thereof are earnestly solicited. In the event the Examiner considers a personal contact advantageous to the disposition of this case, the Examiner is requested to call the undersigned Attorney for Applicants, Jeannette Walder.

Respectfully submitted,



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Xerox Corporation
Santa Ana, California
Date: June 20, 2006